

What Is Claimed Is:

Su 32 1 An electrochemical test strip comprising:

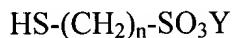
(a) a reaction zone defined by opposing working and reference electrodes separated by a spacer layer, wherein at least one of said first and second electrodes has a surface modified with a homogenous surface modification layer made up of self assembling molecules having a first sulphydryl end group and a second sulfonate end group, wherein said sulphydryl and sulfonate end groups are separated by a lower alkyl linker group; and

10 (b) a redox reagent system present in said reaction zone, wherein said redox reagent system comprises at least one enzyme and a mediator.

2. The electrochemical test strip according to Claim 1, wherein at least one of said electrodes comprises a metal selected from the group consisting of: gold, palladium, silver, iridium, carbon, doped indium tin oxide and stainless steel.

15 3. The electrochemical test strip according to Claim 2, wherein said electrode comprises gold or palladium.

20 4. The electrochemical test strip according to Claim 1, wherein said self-assembling molecules have the formula:



wherein:

n is an integer from 1 to 6; and

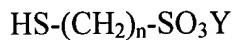
25 Y is H or a cation.

5. The electrochemical test strip according to Claim 1, wherein said at least one enzyme includes an oxidizing enzyme.

Su 33 30 6. An electrochemical test strip comprising:

(a) a reaction zone defined by opposing working and reference electrodes comprising a metal surface separated by a thin spacer layer, wherein at least one of said first and second metallic electrodes has a surface modified with a homogenous surface modification layer made up of self assembling molecules of the formula:

5



wherein:

n is an integer from 1 to 6; and

Y is H or a cation; and

(b) a redox reagent system present in said reaction zone, wherein said redox reagent system comprises enzymes and a mediator.

7. The electrochemical test strip according to Claim 6, wherein said reaction zone has a volume ranging from about 0.1 to 10 μl .

15 8. The electrochemical test strip according to Claim 6, wherein said metal is selected from the group consisting of gold and palladium.

9. The electrochemical test strip according to Claim 6, wherein said enzymes include an oxidizing enzyme.

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10. The electrochemical test strip according to Claim 6, wherein said oxidizing enzyme in a glucose oxidizing enzyme.

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11. The electrochemical test strip according to Claim 6, wherein said self assembling molecule is 2-mercaptopethane sulfonic acid or a salt thereof.

12. An electrochemical test strip for use in detecting the concentration of glucose in a physiological sample, said test strip comprising:

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(a) a reaction zone defined by opposing working and reference electrodes comprising a metal surface selected from the group consisting of gold and palladium

separated by a thin spacer layer, wherein at least one of said first and second metallic electrodes has a surface modified with a homogenous surface modification layer made up of 2-mercaptoethane sulfonic acid or a salt thereof; and

5 (b) a redox reagent system present in said reaction zone, wherein said redox reagent system comprises a glucose oxidizing enzyme and a mediator.

13. The electrochemical test strip according to Claim 12, wherein said reaction zone has a volume ranging from about 0.1 to 10 μ l.

10 14. The electrochemical test strip according to Claim 12, wherein said reference electrode is a gold electrode.

15 15. The electrochemical test strip according to Claim 12, wherein said working electrode is a palladium electrode.

16. A method of determining the concentration of an analyte in a physiological sample, said method comprising:

(a) applying said physiological sample to an electrochemical test strip comprising:

20 (i) a reaction zone defined by opposing working and reference metallic electrodes separated by a spacer layer, wherein at least one of said first and second metallic electrodes has a surface modified with a homogenous surface modification layer made up of self assembling molecules having a first sulphydryl end group and a second sulfonate end group, wherein said sulphydryl and sulfonate end groups are separated by a lower alkyl linker group; and

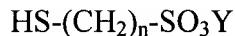
25 (ii) a redox reagent system present in said reaction zone, wherein said redox reagent system comprises at least one enzyme and a mediator;

(b) detecting an electrical signal in said reaction zone using said metallic electrodes; and

(c) relating said detected electrical signal to the amount of said analyte in said sample.

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17. The method according to Claim 16, wherein said self-assembling molecules have the formula:



wherein:

10 n is an integer from 1 to 6; and

Y is H or a cation.

15 18. The method according to Claim 17, wherein said self-assembling molecules are 2-mercaptopropane sulfonic acid or a salt thereof.

19. The method according to Claim 16, wherein said analyte is glucose.

20 21. The method according to Claim 19, wherein said redox reagent system comprises a glucose oxidizing enzyme.

20 21. A kit for use in determining the concentration of an analyte in a physiological sample, said kit comprising:

(a) an electrochemical test strip comprising:

(i) a reaction zone defined by opposing working and reference metallic electrodes separated by a spacer layer, wherein at least one of said first and second metallic electrodes has a surface modified with a homogenous surface modification layer made up of self assembling molecules having a first sulphydryl end group and a second sulfonate end group, wherein said sulphydryl and

sulfonate end groups are separated by a lower alkyl linker group;
and

(ii) a redox reagent system present in said reaction zone, wherein said redox reagent system comprises at least one enzyme and a
5 mediator; and

(b) at least one of:

(i) a means for obtaining said physiological sample; and

(ii) an analyte standard.

10 22. The kit according to Claim 21, wherein said analyte is glucose.

23. The kit according to Claim 21, wherein said physiological sample is blood.

15 24. The kit according to Claim 21, wherein said means for obtaining said physiological sample is a lance.

25. The kit according to Claim 21, wherein said kit further comprises an automated instrument for detecting an electrical signal using said electrodes and relating said detected signal to the amount of analyte in a sample.

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